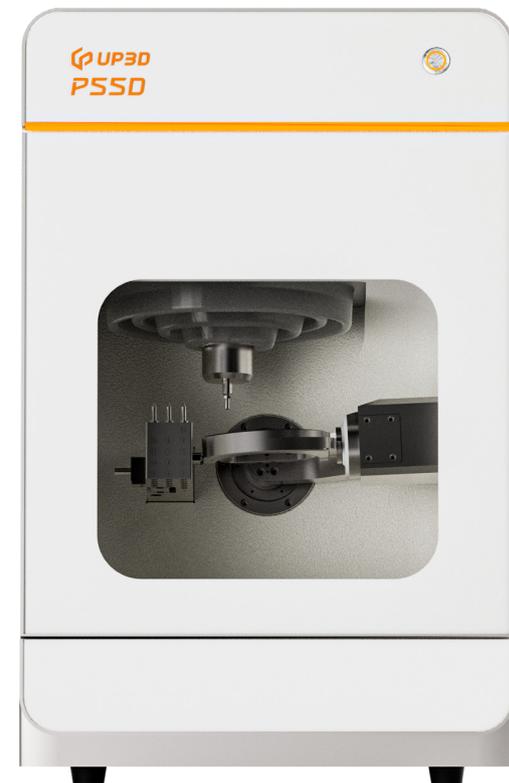


P55D

Dental Intelligent Milling Equipment



User Guide



 www.up3ds.com

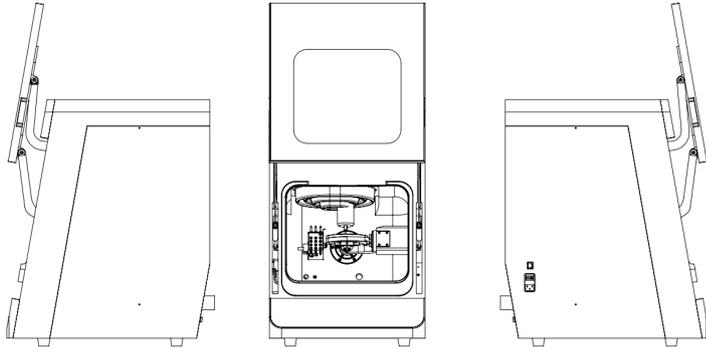
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Thank you for choosing our product. To ensure that you can use this product correctly and safely, and fully understand its performance, please carefully read this operating manual and keep it properly to avoid loss.

Regardless of whether this product has any malfunctions, our company shall not be held responsible for any direct or indirect losses caused by the use of this product. Similarly, our company shall not be liable for any direct or indirect losses caused by the processing of products using this product.

Summary

UP3D is dedicated to continuously optimizing iteration and product development strategies. While we have made every effort to produce the latest product documentation, please note that this document does not serve as an absolute guide for the current equipment. We reserve the right to modify it without prior notice. If you have any questions about this product or discover any misleading information or omissions in this manual, please feel free to contact our company.

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P55D User Guide—Released on May 13, 2024

Originally published in Chinese.

01 /Welcome

Thank you for choosing the P55D Dental Intelligent Milling Equipment. We take pride and confidence in providing you with this advanced technological product. Each device undergoes rigorous quality control to ensure it meets the highest standards upon manufacturing completion.

The purpose of this user manual is to help you fully understand all the functions of the P55D device. Additionally, it aims to assist you in operating and maintaining the equipment correctly to ensure you can maintain high-quality production work.

1.1 Document users

This document is applicable to the following groups and individuals:

- End users
- Distributors at all levels
- Technical support personnel

If you have any questions about this product or need further technical support, please feel free to contact our customer service team. We are dedicated to providing you with support and assistance.

Once again, thank you for choosing the P55D Dental Intelligent Milling Equipment!

02/General instructions

2.1 Expected usage

This product is specifically designed as a cutting device for dry dental processing and is intended solely for dental use. It should not be used for any other purpose. The equipment is capable of cutting dental materials, including but not limited to zirconia oxide, PMMA, PEEK, wax, composite resin, and soft cobalt-chromium alloy, for the fabrication of dental crowns, inlays, bridges, and other oral restorations.

Simply install the UPCNC software on your computer and connect it to the machine to easily produce high-quality dental restorations. For more information about this machine, please visit our company's official website: <https://www.UP3Ds.com/>.

2.2 Operator requests

Only personnel who have undergone professional training, possess sufficient knowledge and experience, are familiar with relevant regulations, capable of executing delegated tasks, and can independently identify and avoid potential hazards are permitted to operate this equipment.

Important Note: The manufacturer assumes no responsibility for damage caused by the following reasons:

- Disregard or neglect of this user guide
- Intentional misuse
- Use for unauthorized purposes
- Operation by untrained personnel
- Use by non-professionals (e.g., during maintenance work)
- Technical alterations to the equipment without consultation with the manufacturer
- Use of unauthorized accessories

2.3 Instructions before use

- Before installing, maintaining, or operating the machine, please carefully read the equipment user manual provided with the machine.
- If you are still unsure how to operate the machine, please refrain from using it and contact technical support for assistance.
- Ensure that each user has timely access to operating instructions and guide each user to operate the machine safely and correctly.

2.4 The machine's operation is incorrect

2.4.1 Electrical Safety Precautions

- Do not remove the machine's casing without authorization, as improper handling may result in electric shock risks.
- Contact with live parts may lead to electric shock, hence avoid operating in moist environments to reduce this risk.
- Do not touch internal machine components with wet or damp body parts to ensure personnel safety.
- Ensure the machine's circuits have functioning ground fault protection devices installed and properly grounded.
- Arrange power cables reasonably to avoid cutting or damaging them.
- Before powering on the machine, always check for cable damage and ensure the main power switch is turned off before unplugging the power cable.
- Do not perform any troubleshooting operations while the machine is running; only trained technical personnel should carry out disassembly and repairs.

2.4.2 Exterior Structure

- Moving exterior components may pose a risk of crushing, such as:
 - Processing chamber operation door
 - Top and side maintenance covers
- To ensure safety, follow these procedures:
 1. Use only designated grip points when moving these exterior components.
 2. Ensure your hands are not caught during the movement process.

2.4.3 Work Chamber

- Moving machine parts inside the work chamber may pose risks of crushing, cutting, and burning. To ensure safety, follow these procedures:
 - Regularly check the equipment for damage, and only use the machine for processing when the work chamber door is fully closed and undamaged.
 - Wear gloves when operating on the machine or handling trays/tools.
 - Only grip the handle of the tool; avoid touching the sharp end of the tool to prevent cuts.
 - Avoid reaching out to touch the main shaft during processing to avoid injuries, and do not touch the main shaft after processing to prevent burns from high temperatures.

2.4.4 Dust protection

- There is a risk of respiratory diseases when processing harmful substances. To protect your health, be sure to:
 - Always use appropriate dust collection systems during dry processing to ensure timely removal of dust and harmful substances.
 - Use dust collectors equipped with M-class ultrafine particle filters to minimize leakage and inhalation of harmful substances.
 - Avoid using materials that may harm health and wear filter-level masks during processing for additional protection.

2.4.5 Processing Noise

- The machine may produce significant noise during operation, which may lead to hearing impairment or tinnitus with prolonged exposure. If loud noise cannot be avoided, wear earmuffs during processing.

2.4.6 Maintenance and Troubleshooting

- Machine malfunctions due to lack of or incorrect maintenance/troubleshooting may pose risks of injury.
 - Perform maintenance tasks according to the maintenance schedule to ensure the machine remains in good condition.
 - Do not perform any troubleshooting operations while the machine is running to prevent accidents.
 - Ensure that only authorized personnel operate the machine to prevent unauthorized access.
 - Ensure the room containing the machine is equipped with an automatic fire detection system to promptly detect and respond to fire threats.
 - Use only genuine spare parts, additional equipment, and accessories for machine maintenance.

2.5 Equipment Damage Risk Reminder

2.5.1 Spindle Related:

- Avoid damage due to lack of maintenance:
 - Clean and replace chucks according to maintenance requirements to ensure the machine operates normally.

- Avoid damage due to unsuitable tools:

- It is recommended to only use original tools provided by Cloud Armor Technology to ensure tool quality and compatibility.

- Use tools within the longest tool life as indicated in UPCNC to avoid poor restoration processing.

- Avoid damage due to impact:

- Do not manually apply pressure to the spindle during operation in the processing chamber to avoid accidental collisions leading to damage.

2.5.2 UPCAM & UPCNC Software

- Avoid equipment damage due to software incompatibility, failures, and/or operator errors:

- Always use the latest supported application software versions to ensure system stability and compatibility.

- Ensure your computer meets the software installation requirements, and read the software usage documentation before installation or operation.

- After extensive testing, UPCAM and UPCNC are highly compatible with the P55D and serve as production control software.

- Cloud Armor Technology allows the use of third-party CAM software as a substitute for UPCAM, but no other solutions may replace UPCNC.

- If third-party CAM software is used, the machining instructions calculated by the software developer are solely responsible for machining results.

2.5.3 Input Voltage

- Avoid damage to the electrical control system due to strong voltage fluctuations:

- Connect the machine to a dedicated power circuit or ensure that no other devices are connected to the circuit to avoid voltage fluctuations.

- If severe voltage fluctuations cannot be avoided, install a stabilizer to protect the machine from the effects of strong voltage fluctuations.

2.5.4 Dust Collection System

- It is strictly prohibited to start processing without connecting the dust collection system.

- The machine must be equipped with a "dust collection device" for sucking processing dust.

- The machine cannot complete processing without a dust collector.

- Frequently clean up processing debris to maintain cleanliness inside the processing chamber.

- Damages to internal components due to the lack of a dust collector require paid repairs.

2.5.5 Equipment Movement/Usage Environment

- The device must work on a stable workbench to ensure stability and reliability.

- During equipment transfer, prevent damage from falling, collision, strong vibrations, or other mechanical forces.

- Do not use the equipment in environments with temperatures, pressures beyond the requirements of the equipment.

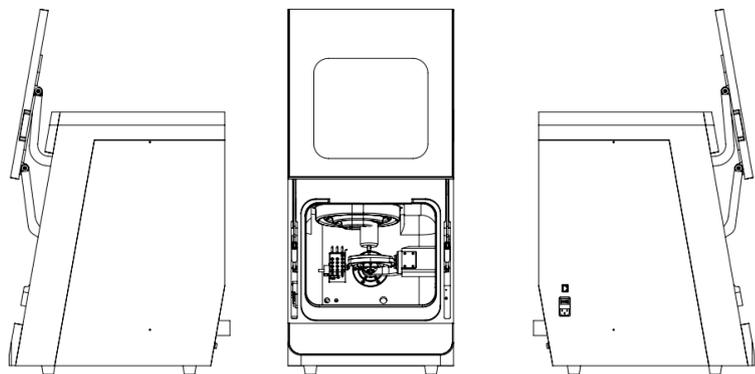
- Do not use the equipment in environments containing flammable or explosive materials to prevent fires or explosions.

- Keep children and animals away from the machine.

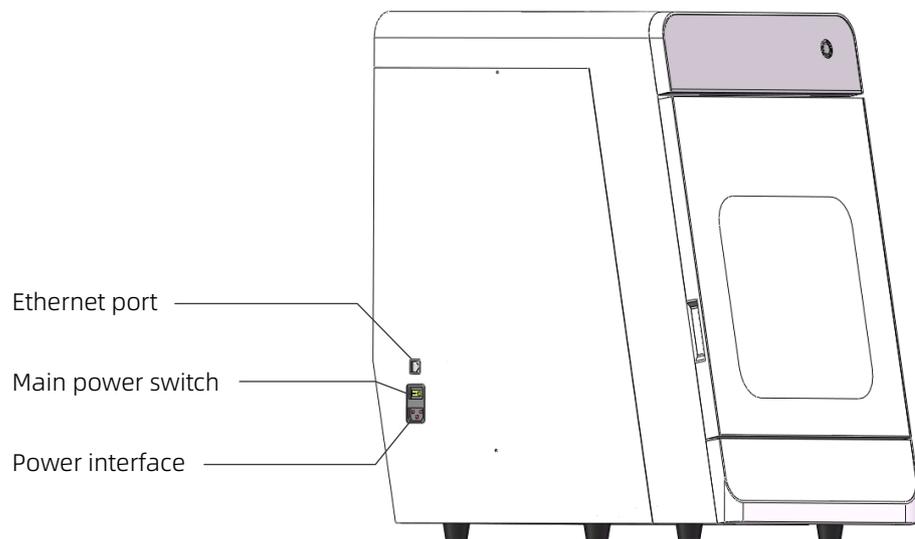
03/overview of the equipment

3.1 Names and Functions of Equipment Components

Equipment Display



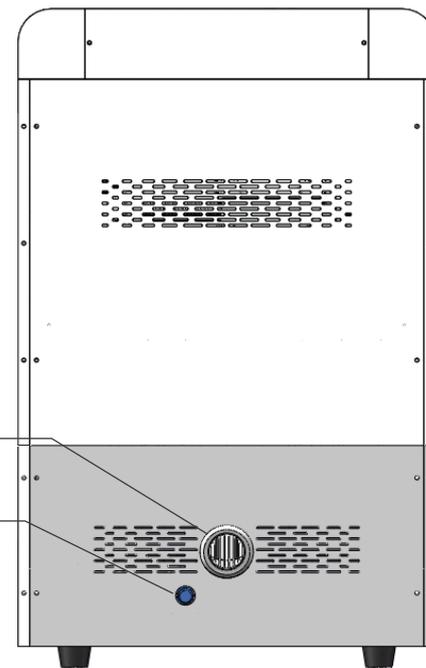
Side view of the equipment



Back view of the equipment

Vacuum cleaner pipe interface

Vacuum linkage port



Inside the processing chamber

Silicone protective cover

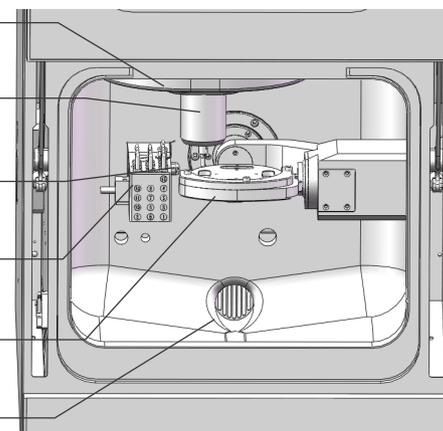
High-frequency electric spindle

Negative ion generator

Tool magazine

A/B axis structure

Vacuum inlet



Introduction to the tool magazine

Ion generator

Tool setter

Calibration column

Tool Magazine 1: Zirconia / Wax 2.0mm

Tool Magazine 2: Zirconia / Wax 1.0mm

Tool Magazine 3: Zirconia / Wax 0.6mm

Tool Magazine 4: Zirconia / Wax 0.3mm

Tool Magazine 5: PMMA 2.0mm

Tool Magazine 6: PMMA 1.0mm

Tool Magazine 7: PMMA 0.6mm

Tool Magazine 8: Spare

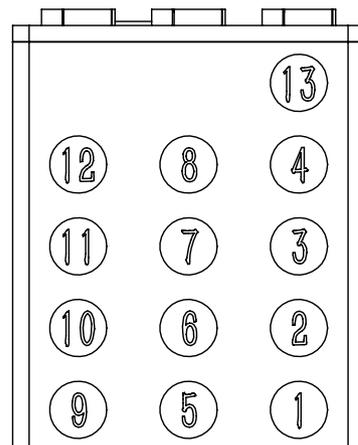
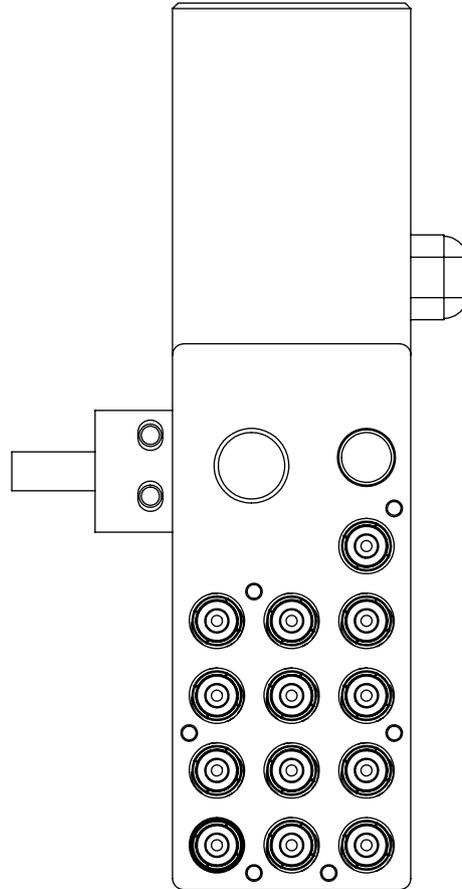
Tool Magazine 9: Composite resin 2.0mm

Tool Magazine 10: Composite resin 1.0mm

Tool Magazine 11: Composite resin 0.6mm

Tool Magazine 12: Spare

Tool Magazine 13: Calibration magazine



04/Equipment Installation

4.1 Equipment Delivery

Upon arrival of the equipment, please follow these steps and inspect the outer packaging for any damages. Pay attention to safety instructions while handling, and be sure to wear protective gloves.

4.1.1 Check the Transport Packaging

Carefully inspect the transport packaging for any damages to ensure the outer packaging is intact, preventing any potential damage to the equipment during transportation.

4.1.2 Unpacking the Box

Unlock the locks of the packaging box and carefully lift the packaging box off the equipment.

Note: It is recommended to retain the original packaging for future moving and transportation. This helps ensure proper protection of the equipment during movement, reducing the risk of damage during transportation.

4.2 Confirm Accessories

A accessories box is placed inside the packaging. Please check the items inside the accessories box according to the shipping list to ensure the completeness of the supply, and to identify any damages or missing accessories due to transportation."

Item	Name	Specification	Qty	Style
1	Accessory Kit	Standard	1	
2	Network cable	5m	1	
3	Power cable	Standard	1	
4	burs	φ2	3	
		φ1	3	
		φ0.6	3	
		φ2	1	
		φ1	1	
		φ0.6	1	
		φ4	1	
5	Hexagon wrench	1.5~5mm	1	
6	WAX	98×12mm	3	

Item	Name	Specification	Qty	Style
7	Callibration disc	/	1	
8	Clamp gland		1	
9	Fixture screw	Stainless steel hexagon socket head cap screws M4×16	9	
10	USB drive		1	
11	Dongle		1	
12	brush		1	
13	Magnetic	Φ22	2	
14	Automatic dust control line		1	
15	T-type torque wrench (Torque wrench)	0.6N*M	1	

Item	Name	Specification	Qty	Style
16	Spindle chuck cleaning set		1	
17	M3*75 hexagon bits		1	

Note:

If there are any issues, please contact the UP3D technical support department immediately for assistance to avoid unnecessary complications caused by delayed communication.

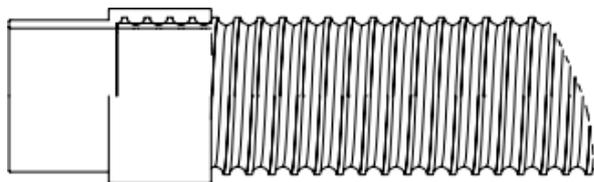
4.3 Additional Peripheral Equipment Preparation Required

Dust Collector

A dust collector is required for the operation of the equipment. It is used to collect and remove dust, waste, and particles generated during machine operation, maintaining a clean working environment, reducing the impact of dust on operator health, preventing fire or explosion hazards, and avoiding damage to components caused by dust entering the equipment.

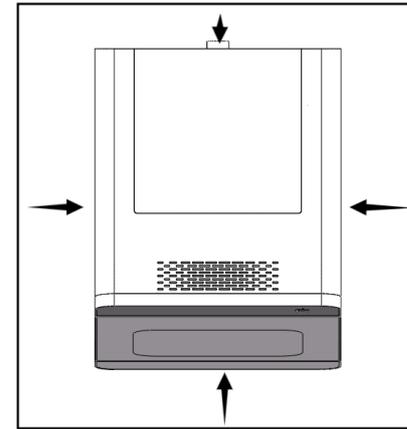
Please ensure that the dust collector meets the following requirements:

- Airflow: $\geq 2600\text{L/M}$
- Suction: $\geq 52\text{KP}\cdot\text{m}^3/\text{s}$
- Diameter of vacuum hose: Inner diameter 40mm, outer diameter 48mm



4.4 Selection of Installation Environment

Equipment Transportation: Due to the heavy weight of the main unit alone, which is 106KG, at least 4 personnel are required for transportation. Ensure that each person has sufficient strength to participate in the transportation. When transporting, lift and carry the equipment from the four bottom corners together. Be sure to hold the equipment firmly to prevent dropping. This ensures the safety and smoothness of the transportation process.



Installation Site Requirements:

Equipment Weight: 106KG

- The equipment must be placed on a sturdy and level surface capable of bearing the weight of the machine.

Equipment Dimensions: Length 560mm × Width 442mm × Height 704mm

- The dimensions of the installation area should exceed the actual size of the equipment to ensure stable installation.

Power Supply for the Equipment: AC 100V ~ 130V or AC 200V ~ 240V, 50 ~ 60Hz

- The equipment power connection must have a ground wire and ensure stable voltage with intact wiring.
- Install in a location where the power plug can be easily controlled at all times for quick unplugging in case of emergencies.

After confirming the installation location, gently move the purchased product and place it on the workbench. Ensure the workbench is stable, the product is placed steadily, and the surroundings of the equipment are kept clean and tidy. Open the packaging box door, take out the foam padding used for protection one by one, and place them properly (keep them for future maintenance and transportation).

Note: Do not install in the following environments:

- Environments with large temperature/humidity fluctuations
- Environments with shaking or vibration
- Environments with high electromagnetic interference such as electromagnetic waves

⚠ 4.5 Removal of Transportation Locks

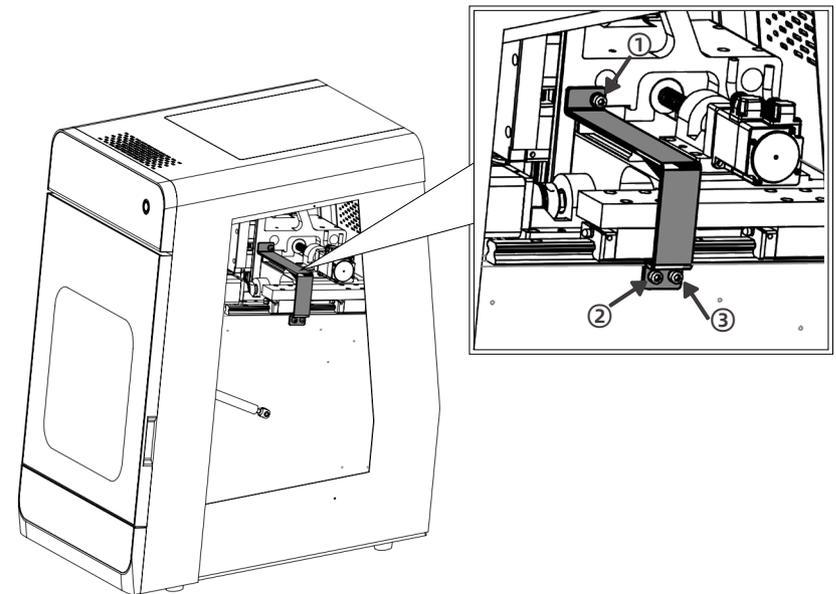
To protect the equipment from the effects of transportation vibration, transportation locks are installed inside the equipment. After confirming the placement of the equipment, be sure to remove the transportation locks and store them properly.

Note: Please perform this operation before connecting the power cables to avoid malfunctions caused by incorrect actions during equipment operation.

The diagram below shows the installation position and disassembly method of the transportation fixing device. Please follow the instructions in the diagram. Please store the disassembled transportation fixing device properly to avoid loss.

Tools Required: Please use a 4mm Allen wrench.

- Remove the right side panel.
- Use a 4mm Allen wrench to sequentially remove the three bolts of the fixing device.
- Remove the screws and fixing device.
- Reinstall the right side panel.



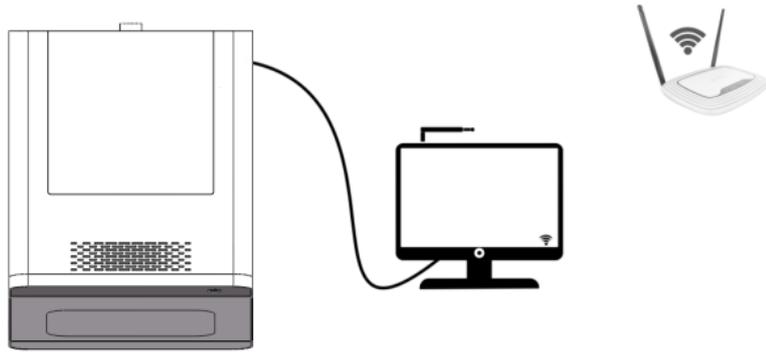
Note:

The transportation lock is an essential accessory for the equipment during transportation and long-distance movement. Please store it properly to avoid loss.

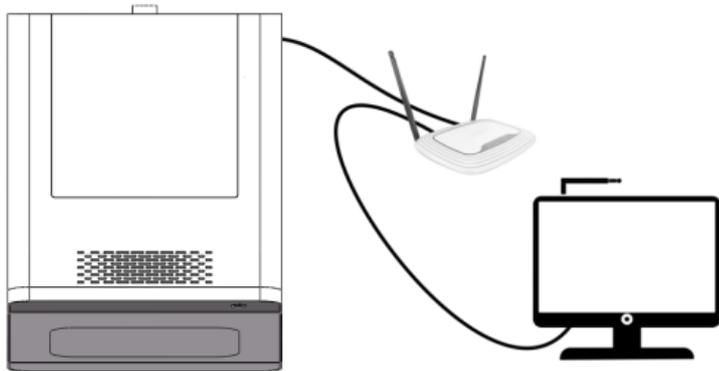
05/Equipment Connection

5.1 Diagram of Equipment Connection

Directly connect the equipment to the computer with UPCNC installed.



Connect to the computer with UPCNC installed via the local network (converter).



5.2 Computer Selection & Software Installation

Requirements for CNC Computer:

	Minimum Specification	Recommended Specification
Operating System	Intel® Celeron® J1900	Intel i5-5350H
CPU	4GB	8GB
Storage	50GB	100GB
Drive	WINDOWS 10 x64	WINDOWS 10/11 x64
Graphics Card and Display	1024*768	1920*1080

Installed Software:

UPCAM	Used for layout generation and toolpath creation from design files for cutting.
UPCNC 3	Used to control the machine to execute related instructions.

CNC 3 Installation Process:

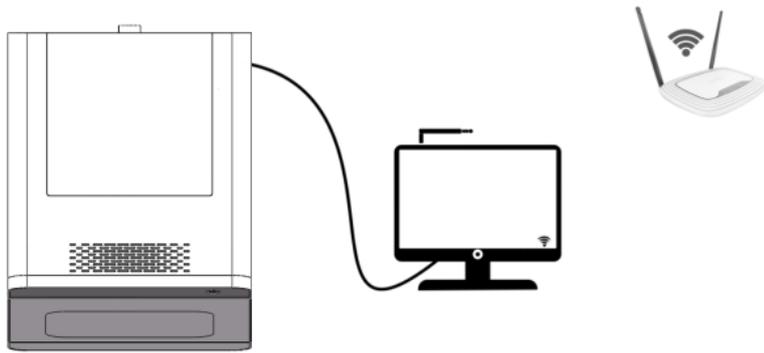
- 1.Install CNC 3 on the computer by double-clicking on the software installation package.
- 2.Choose the installation language. Choose according to the actual situation and click Next.
- 3.Choose the installation location. Select the disk location for installation. Make sure the selected disk has sufficient space and click Next.
- 4.Add shortcut to desktop. Click Next.
- 5.Installation complete. Launch CNC 3.
6. The current display when CNC 3 is not connected to the device."

5.3 Establishing Control Connection

To ensure a stable control connection, it is recommended to use the network cable provided with the machine to connect the equipment to the computer.

Connection Method 1: Direct Connection to Computer or Local Network

1. Insert the provided network cable into the network port on the machine's connection panel.
2. Insert the other end of the network cable into the network port on the computer



To configure the computer to connect to the machining machine's IP address under the Win10 system, follow these steps:

1. Open "Control Panel" and click on "Network and Internet".
2. In "Network and Sharing Center", click on "Change adapter settings".
3. Find the network adapter that connects to the machining machine, right-click it, and select "Properties".
4. In the dialog box that appears, find "Internet Protocol Version 4 (TCP/IPv4)" and double-click to open it.

5. Select "Use the following IP address", then enter the IP address, subnet mask, and default gateway you want to set.
6. When setting the IP to 192.168.0.x, x can be any value except 0, 1, or 100.
7. Click "OK" to save the changes. After completing the above steps, your IP address is reconfigured.

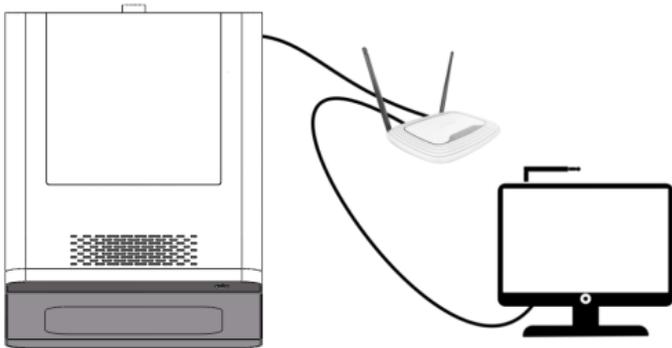
Under the Win11 system, follow these steps to reconfigure the computer to connect to the machining machine's IP address:

1. Click on the "Start" button on the Windows taskbar, then click on the "Settings" icon.
2. In the Settings window, click on "Network & Internet".
3. On the network settings page, find and click on "Advanced network settings".
4. In the left menu, select "Ethernet", find the network connection you want to configure, and click the expand button.
5. In the options page, find "More adapter options", right-click, and select "Edit".
6. In the network connection window, find "Internet Protocol Version 4 (TCP/IPv4)" and double-click to open it.
7. Select "Use the following IP address", then enter the IP address, subnet mask, and default gateway you want to set.
8. When setting the IP to 192.168.0.x, x can be any value except 0, 1, or 100.
9. Click "OK" to save the changes. After completing the above steps, your IP address is reconfigured.

After completing the above steps, your computer's network card IP address is reconfigured. Please ensure that the entered IP address matches the IP address range of the machining machine's network and avoid conflicts with other devices.

If you want to connect via the network:

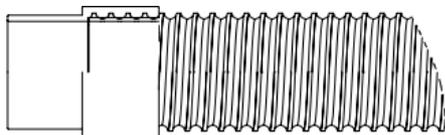
1. Insert one end of the network cable into the network port on the machine's connection panel.
 2. Insert the other end of the network cable into a port on the local network, such as a router or switch.
- The computer must also be connected to the same network.
 - IP assignment in the network must be handled by a DHCP server.



5.4 Establishing Vacuum Connection

- ⚠ This machine must be equipped with a dental vacuum cleaner specifically designed to remove machining debris.
- ⚠ Without a vacuum cleaner, the machine cannot complete machining tasks.
- ⚠ Please configure the vacuum cleaner in advance, and ensure it runs simultaneously during machining.

Inner diameter 40mm
Outer diameter 48mm



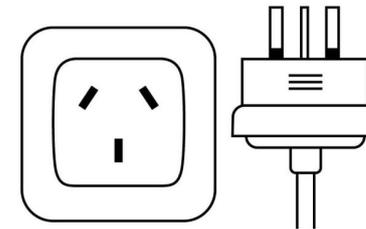
During installation, please read the vacuum cleaner's instruction manual and follow these steps:

- Step 1: Place the vacuum cleaner body in a suitable area.
- Step 2: Connect the vacuum cleaner to the machining machine with the vacuum pipe.
- Step 3: Connect the machining machine linkage line.
- Step 4: Insert the power cord into the vacuum cleaner body and turn on the power.

5.5 Establishing Electrical Connection

The machine needs continuous power supply to operate normally:

- Insert the power cord included in the accessory box into the power interface on the machine's connection panel.
- Insert the plug into a socket protected by a residual current device/ground fault circuit interrupter.
- Use a separate power strip or power input, do not use extension cords or power strips.
- Ensure voltage stability. If a power failure occurs during operation, the needle and material may be damaged.



Note: Do not bundle the power cord and network cable together to avoid interference, which may cause abnormal operation of the equipment."

06/Equipment Operation

6.1 Equipment Startup

When starting the equipment for the first time, there is a risk of short circuit if the equipment is in an excessively cold state. If the machine is transported from a cold environment to a warmer one, condensation may cause a short circuit.

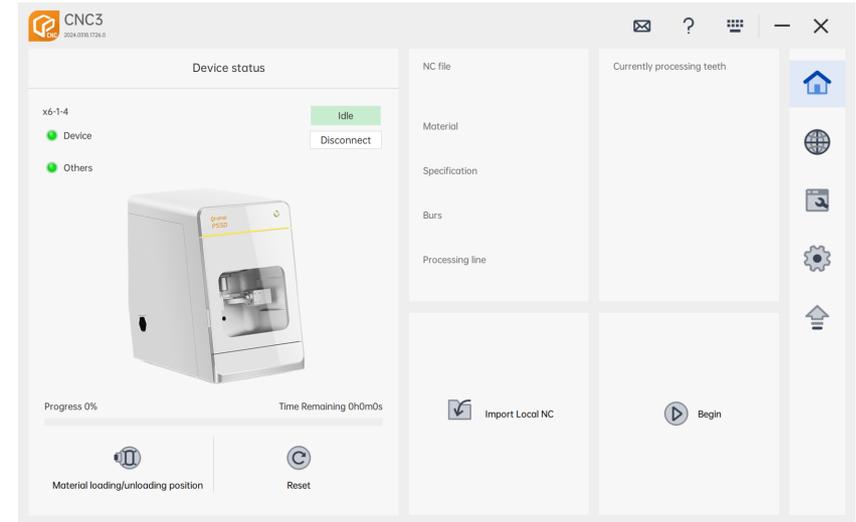
After the initial preparations, ensure the following:

- Ensure that the temperature of the environment where the equipment is located meets the requirements for the equipment's operation.
- Before turning on the power, ensure that the machine's temperature is the same as the ambient air temperature.
- Ensure that the interior of the machine is completely dry to avoid the risk of short circuits caused by moisture.

⚠️ Pre-start check: Ensure that the transportation lock has been removed and the equipment's power connection is correct.

After completing the above checks, follow these steps to start the equipment:

1. Ensure that the equipment's operating door is closed, and the equipment is in a closed state.
2. Turn on the main power switch of the equipment and press the power button on the front panel of the equipment.
3. Check if the LED lights on the equipment are on. At this point, the equipment will not home, but the indicator lights indicate that the power is properly connected.
4. Double-click to start the UPCNC control software on the computer and confirm that the equipment is successfully connected.



If the machine is not displayed in UPCNC, please follow these steps to check:

1. Machine Power: Ensure that the machine is powered on and the main power supply is connected.
2. Wired Connection: If you are using a wired connection, make sure all cables are properly connected to the machine and the computer's network ports. Check for loose or damaged cables.
3. Wireless Connection: If you are using a wireless LAN, ensure that the signal is strong enough. If the signal is weak, consider temporarily switching to a wired connection to test and eliminate the possibility of unstable wireless signals.
4. Firewall Settings: Check the firewall settings to ensure that the firewall is not blocking the connection between the machine and the CAM computer. You can try temporarily disabling the firewall to test if it is preventing the connection.

6.2 Removing the Chuck Fixing Rod

To ensure the stability of the chuck during transportation, a fixing rod is equipped on the spindle. It needs to be manually removed during the initial startup of the machine.

⚠ If the fixing rod is not removed, it may collide with machine parts, risking damage to the spindle.

Please follow these steps to remove the fixing rod:

1. Open the equipment operating door.
2. ⚠ Caution! Please wear gloves and place your hand under the spindle.
3. In UPCNC, click on the chuck release button. The fixing rod will fall into your hand. Remove it.

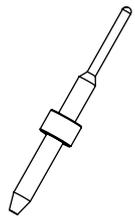
6.3 Equipment Calibration

The P55D device features intelligent automatic calibration, which enables easy one-click precision calibration and compensation. To ensure the long-term stable production of high-quality restorations, it is recommended to regularly calibrate the equipment.

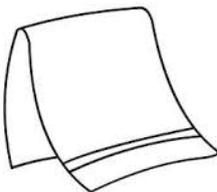
Cases requiring equipment calibration include:

1. After the device is first powered on to eliminate possible transportation effects.
2. After long periods of high-intensity operation (after 3 months of high-intensity work).
3. When abnormal conditions occur during equipment processing (such as cutting edges, blade marks, or tooth loss).
4. After significant relocation or movement of the equipment.

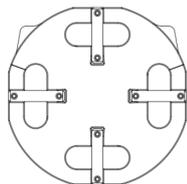
Before performing equipment calibration, you need to prepare the following tools:



Calibration Rod



Dust-Free Cloth

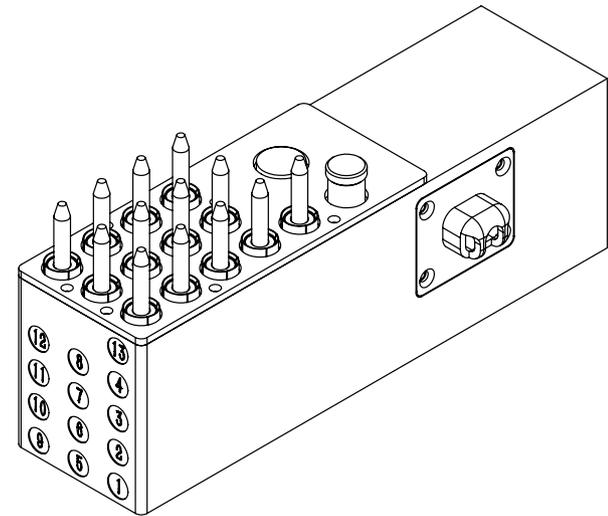


Calibration Plate

6.3.1 Installing the Calibration Rod

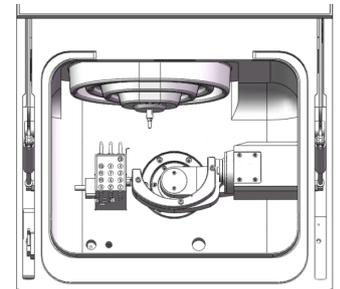
Before calibration, please ensure the following preparations:

1. Clean the working chamber: Use a vacuum cleaner to remove dust from the processing chamber, ensuring cleanliness and no debris.
2. Wipe key components: Use a lint-free cloth to wipe the tool holder and the surrounding area of the fixture, ensuring the surface is clean and free of dirt and dust.
3. Spindle cleaning: Use a brush and lint-free cloth to clean the bottom surface of the air guide sleeve to ensure no dust affects it.
4. Spindle chuck cleaning: Loosen and remove the spindle chuck and clean it.
5. Install the calibration rod onto the 13th tool magazine, ensuring it is fully inserted to ensure accuracy.



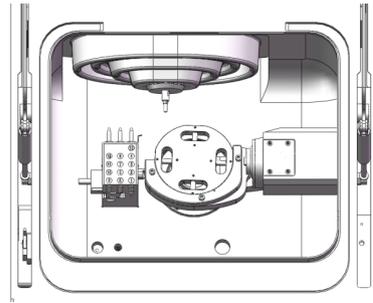
6.3.2 Installing the Automatic Calibration Plate

① As shown in the figure, click on the material removal position in CNC 3, and insert the automatic calibration plate into the clamp of the P55D.



②. Take out the hex wrench, tighten the fixture firmly in place, gently pull on the automatic calibration plate to confirm that it will not fall off.

③. Close the equipment operating door.



6.3.3 Initiating Automatic Calibration

Open the computer connected to the P55D device and start the CNC3 software.

① In the CNC3 interface, select the device to operate.

--- If multiple devices are connected, click on the corresponding icon in the device list to switch devices.

② Enter the device maintenance main interface and find the calibration function.

--- Click on the calibration icon, follow the on-screen instructions, and confirm that the preparation work has been completed.

③ Click the calibration button to start automatic calibration.

--- During the calibration process, the intelligent light strip will display blue, indicating the progress of calibration.

④ After calibration is complete, the device will display relevant prompt messages.

--- Click confirm, and the device will be ready for normal use.

After completing the automatic calibration, use the hex wrench to loosen the fixing screws on the fixture body, remove the calibration plate from the fixture body, and place it properly.

07 /CNC3 Software Interface Overview

CNC3 is an intelligent control program developed independently by UP3D. It allows the operation of the machining unit through computer software. With CNC3, you can conveniently monitor and manage the operation of the machining unit, ensuring machining efficiency and quality.

Its main functions include:

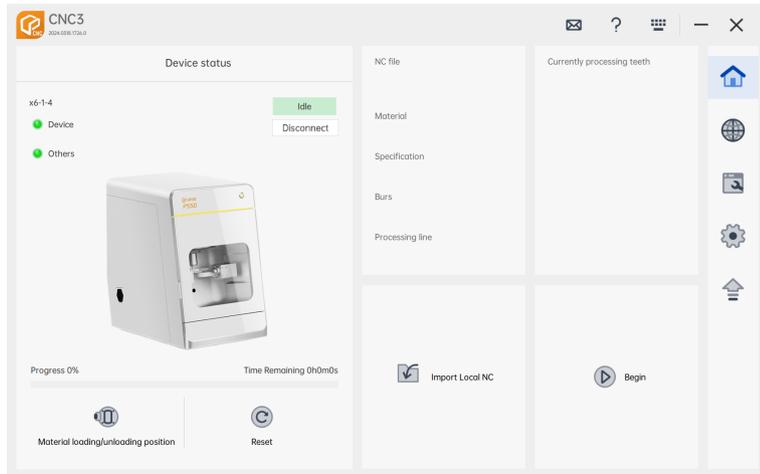
- Machining Data Output: You can send machining data to the machining unit through CNC3 to initiate machining tasks.
- Maintenance: CNC3 provides maintenance functions to help manage maintenance plans and execute maintenance tasks for the machining unit.
- Calibration: Various calibration operations can be performed using CNC3 to ensure the accuracy and stability of the machining unit.
- Status Display: CNC3 displays real-time information about the status of the machining unit, including current operation status and work progress.
- Error Prompt: It promptly alerts and assists in troubleshooting errors or abnormal conditions occurring in the machining unit.

7.2 CNC3 Main Interface

7.2.1 Display of Main Interface Information

Interface Analysis:

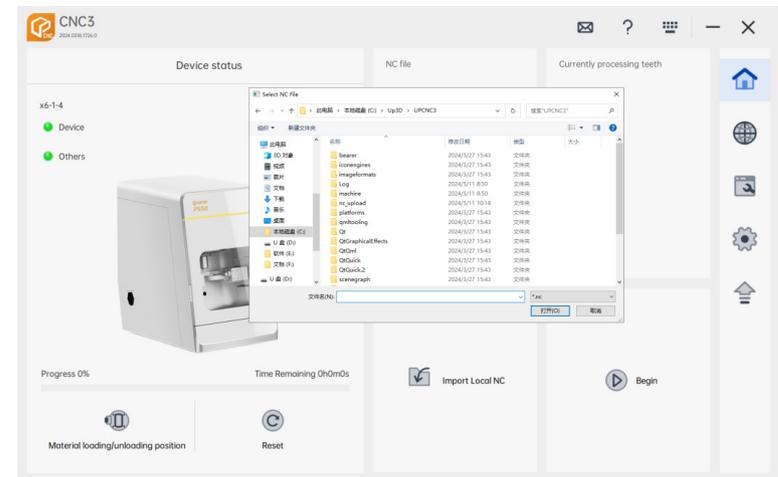
1. Material Disassembly Position: Move the device fixture to a position convenient for disassembling and installing materials.
2. Import Local NC: Open a local folder to import the NC file that needs to be processed.



3. Start: After successfully importing the NC file, click "Start" to execute the machining instructions for the current NC file.
4. Reset: Clear all states of the current machining unit, making the device idle.
5. Version Information: Displays the current version information of CNC3.
6. Auxiliary Functions: Includes message prompts, help, keyboard shortcuts, minimize, and close buttons.
7. Main Functions: Provides access to the main page, machining mode, equipment maintenance, settings, and upgrades.
8. Machining Unit List: Displays information about the list of machining units successfully connected to CNC3.
9. Machining Unit Status: Allows for expanding the device list to perform operations such as disconnecting/connecting machining units.
10. NC Machining File Information: Displays detailed information about the current machining NC file.

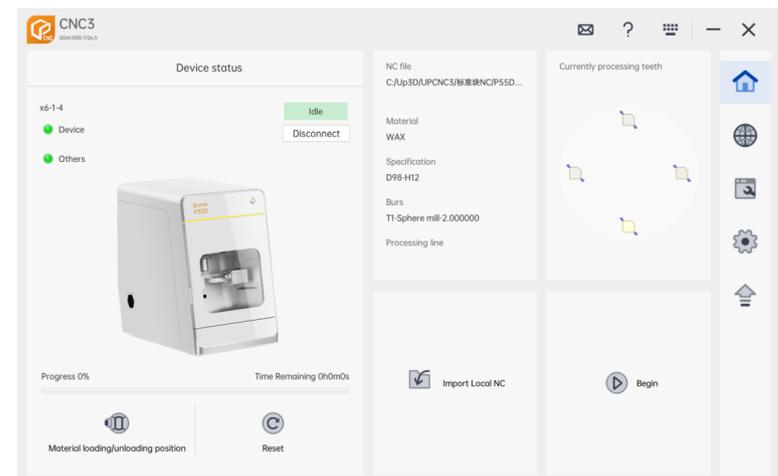
7.3 CNC3 Machining Interface

Import File:



1. Click "Import Local NC" to open a local folder.
2. Select the desired NC file for machining from the local folder. After selecting, click "Open" or double-click to import the file.
3. Import: After successful import, CNC3 will display information about the NC file ready for machining.

Start Machining:

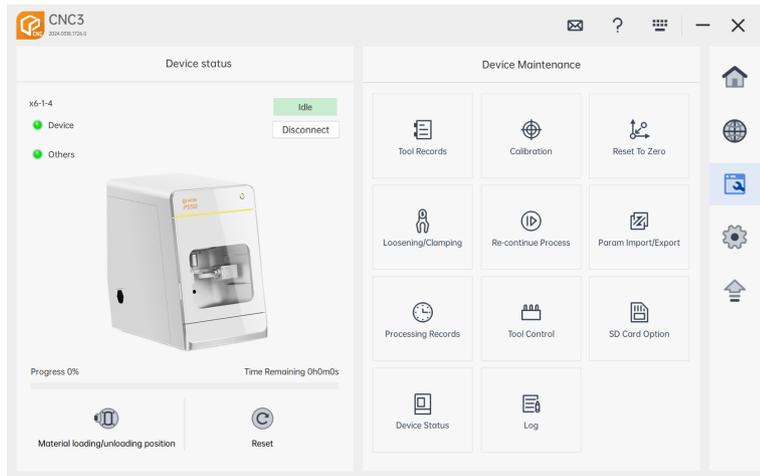


1. Start/Pause: After importing the NC file, clicking "Start" initiates the machining process. The "Start" button changes to "Pause". Clicking "Pause" halts the machining process, and the button changes to "Resume". Clicking "Resume" resumes machining.

2. Reset: During machining, clicking "Reset" stops the machining process, returning the device to standby mode and resetting the machining progress to zero.

7.4 CNC3 Maintenance Interface

7.4.1 Device Maintenance Interface



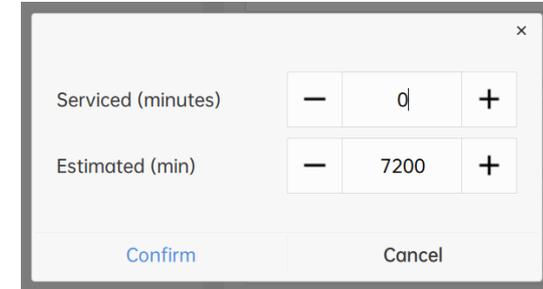
7.4.2 Tool Log

Tool Log Page: This page records and displays the usage of each tool on the current machining machine.

Tool number	Serviced time
Tool number 1	Serviced time 6.26% (451Minute)
Tool number 2	Serviced time 0.00% (0Minute)
Tool number 3	Serviced time 0.00% (0Minute)
Tool number 4	Serviced time 0.00% (0Minute)
Tool number 5	Serviced time 0.31% (22Minute)
Tool number 6	Serviced time 0.32% (23Minute)
Tool number 7	Serviced time 0.00% (0Minute)

Reset Option

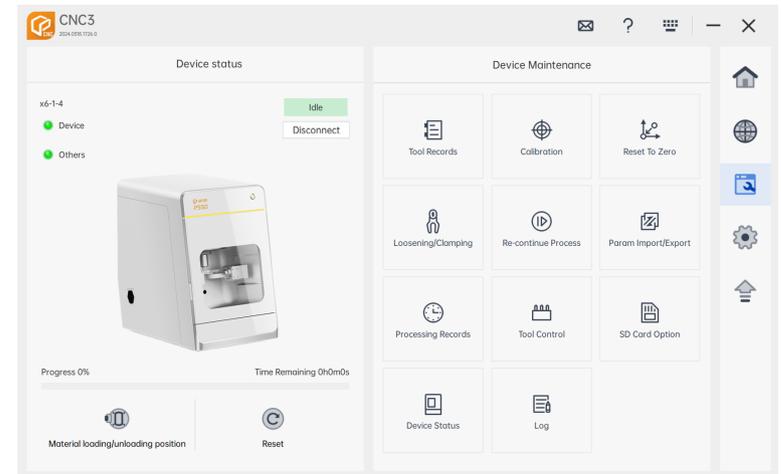
Reset: After selecting any tool, clicking on "Reset" will reset the current usage record.



Configuration: After selecting any tool, clicking on "Configuration" will take you to the tool configuration page, where you can edit the record information.

Elapsed Time (minutes): Records the duration of needle use.

Estimated Time (minutes): The maximum duration suitable for the current tool's use.

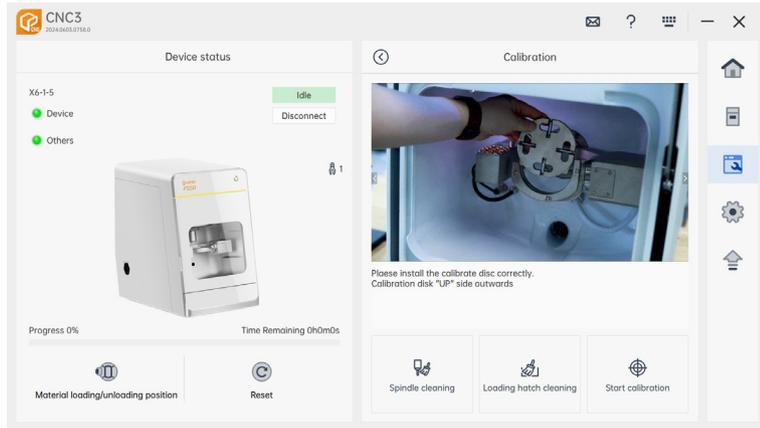
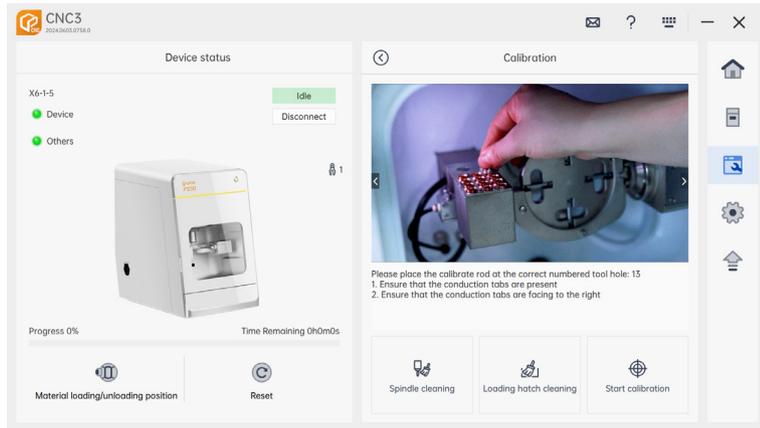


Note:

1. The tool usage duration setting cannot exceed the estimated time.
2. When the tool usage time reaches 90% of the estimated time, CNC3 will provide a tool life reminder, and the current tool life will turn red.

7.4.3 Calibration Interface:

Calibration: Upon entering the calibration page, the current calibration rod tool holder number and calibration disc material bin number will be displayed.



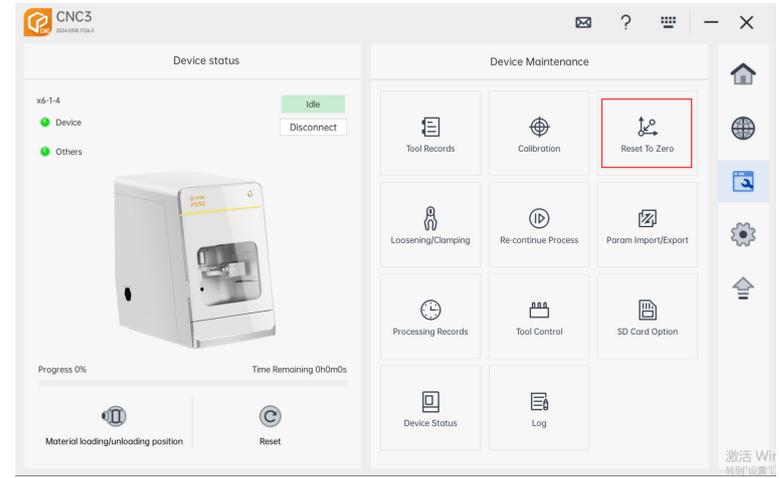
Spindle Cleaning: Clicking on "Spindle Cleaning" moves the current machine to a specified position and opens the chuck.

Bottom Cleaning: Clicking on "Bottom Cleaning" moves the current machine to a specified position.

Start Calibration: Clicking on "Start Calibration" returns CNC3 to the main interface, and the machine begins the calibration process.

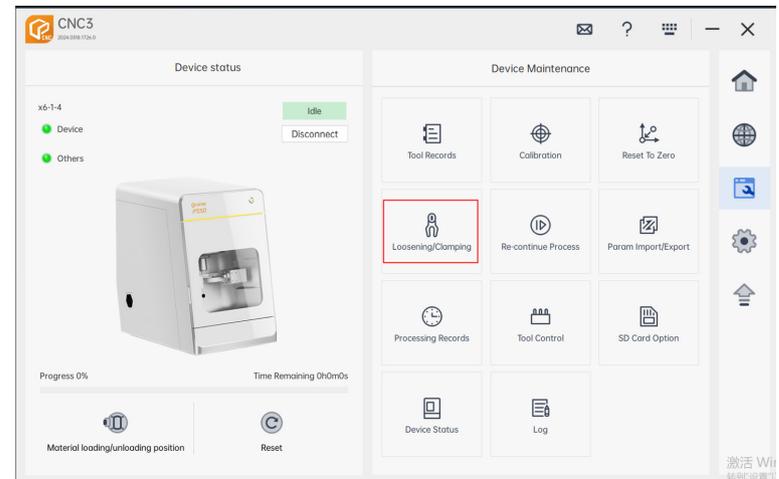
7.4.4 Homing

Homing: Clicking on "Homing" moves each axis of the machine to its initial origin point.

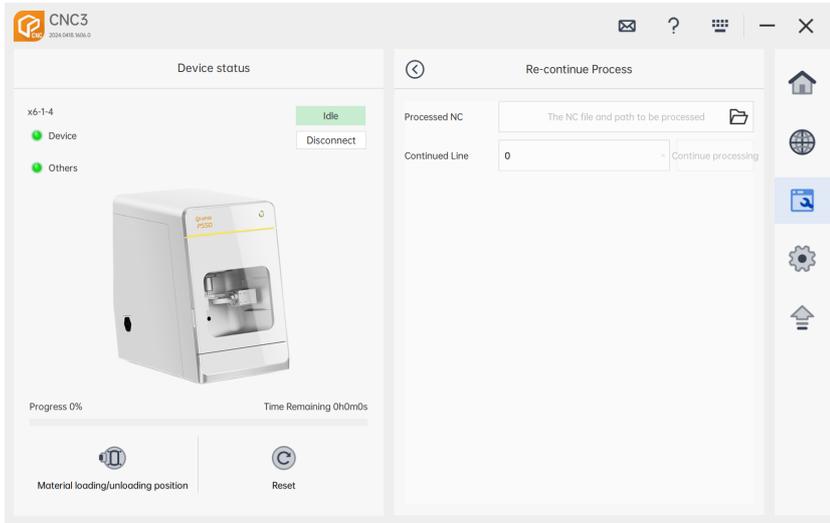


7.4.5 Chuck Release

Release Chuck: Open and Close the Main Spindle Chuck



7.4.6 Continue Machining



Historical Machining NC:

1. Automatically reads the interrupted lines from the current machining NC file.
2. Can manually select historical NC files.

Historical Machining Lines:

Automatically reads the operational data from historical machining NC files.

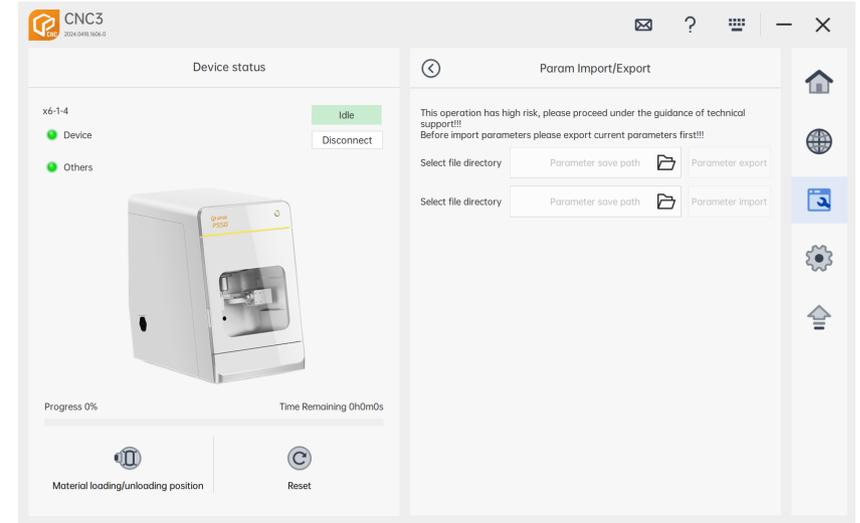
Resume Machining:

Clicking "Resume Machining" will read the interrupted lines and continue machining.

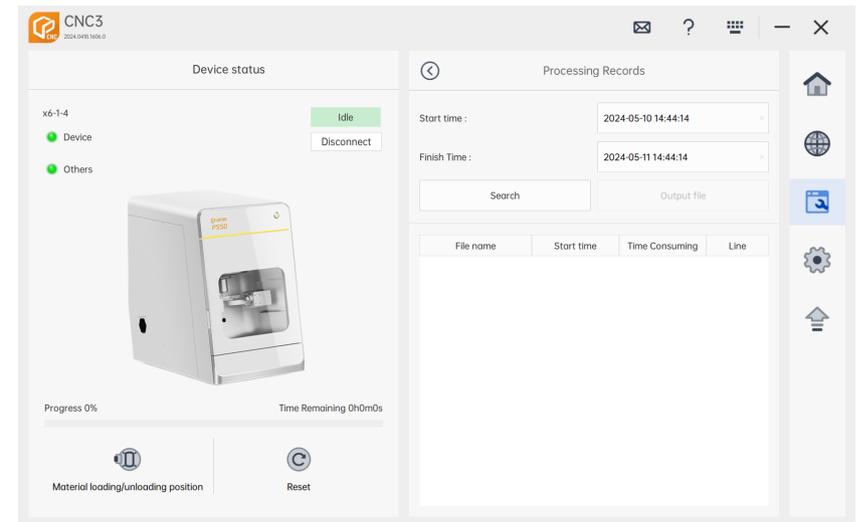
7.4.7 Parameter Import/Export

Parameter Export: Click on "Select File Path", choose the desired path, and then click "Parameter Export". This action will export the current machine parameters to the specified directory.

Parameter Import: Click on "Select File Path", choose the corresponding parameter file, and then click "Import". This will replace the current machine parameters with those from the imported parameter file.



7.4.8 Historical Processing Records

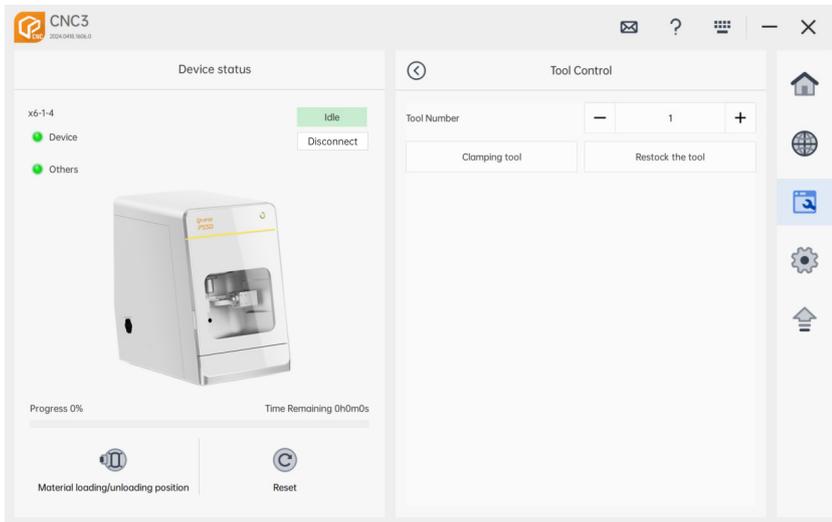


Start Time and End Time: Displays the start and end times of historical NC processing. Clicking on it opens a dropdown menu where you can select the historical processing time and start time.

Search: After selecting the start and end times, click on "Search" to display all processing records within that time range, including file names, start times, processing duration, and processing lines.

Export File: After searching for the corresponding historical processing records, click on "Export File". Select the export file path, and the historical processing records will be exported locally.

7.4.9 Tool Control

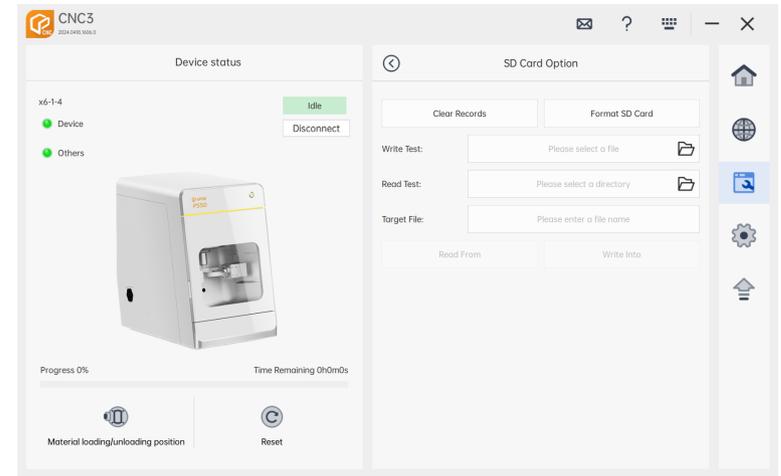


Clamp Tool: Select any tool number, then click "Clamp Tool". The machine will grip the tool corresponding to the selected tool number.

Return Tool: Click "Return Tool". The machine will return the currently held tool to its designated tool slot.

7.4.10 Tool Control

Note: This function is used to verify if the SD card reading and writing are functioning properly.



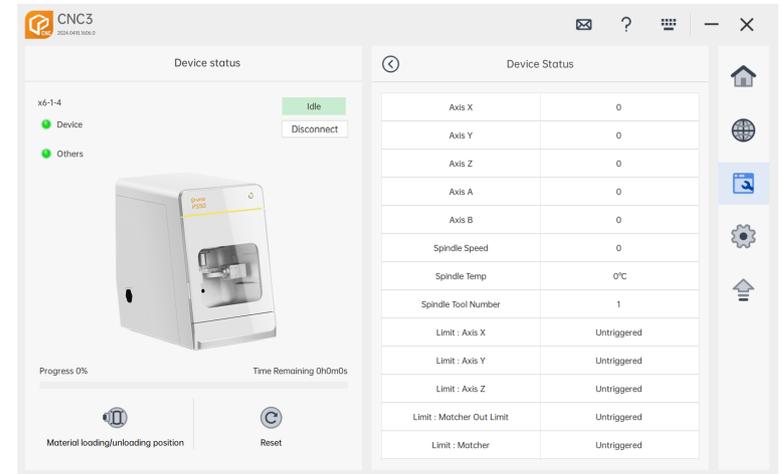
Clear Log: Clears the logs stored on the machine's controller.

SD Format: Formats the SD card.

Write: Select a local document, then click "Write" to transfer the file onto the SD card.

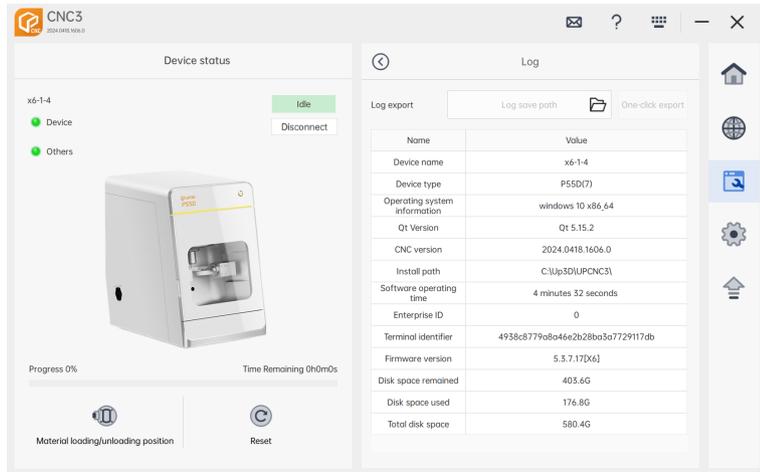
Read: Choose a local file path, then click "Read" to retrieve the document previously written onto the SD card to the selected file path.

7.4.11 Device Status



Device Status: Displays the current coordinates of each axis on the machining machine and whether limit switches are triggered.

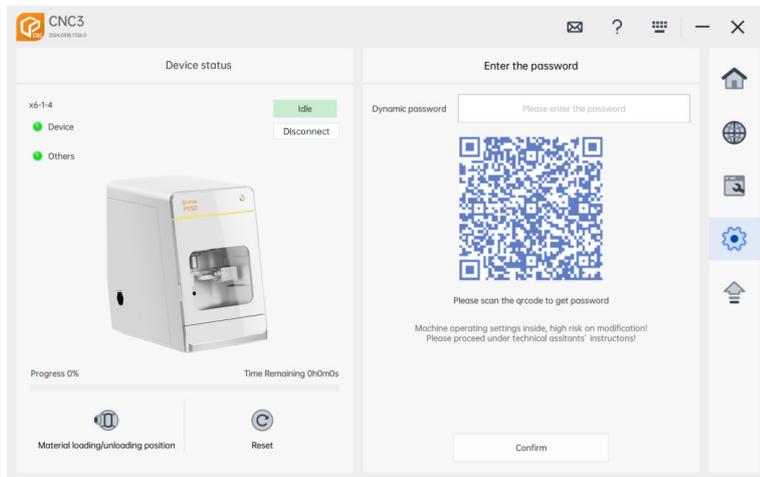
7.4.12 Logs



Log Export: Click on Log Export, select the export path, and then click Export All to export all log information of the current machining machine, including the lower machine log, device information, operating environment, Link information, current NC file, machining machine parameters, and upper machine log.

7.5 CNC3 Setting Interface

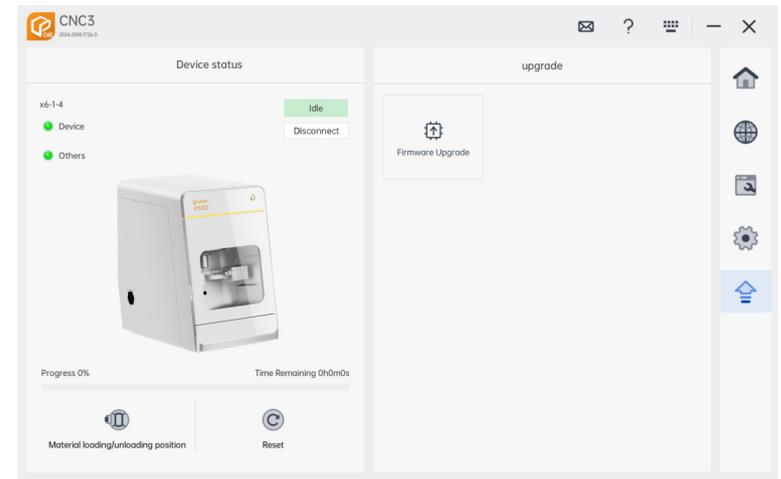
7.5.1 Advanced Settings



Enter Password: Clicking on the settings page will pop up a dialog box to scan the code using the app for login. Note: This feature is for after-sales maintenance use, so password protection management is implemented.

7.6 CNC3 Upgrade Interface

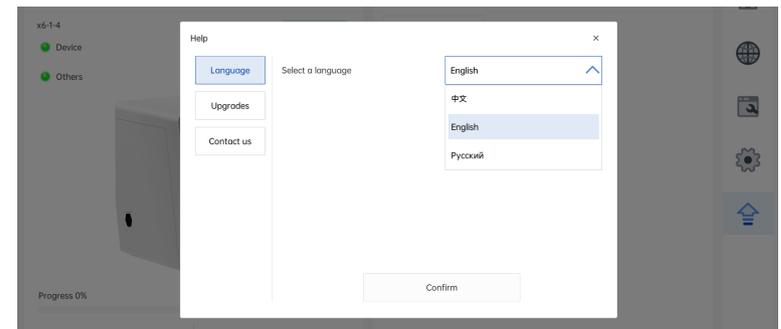
7.6.1 Firmware Upgrade



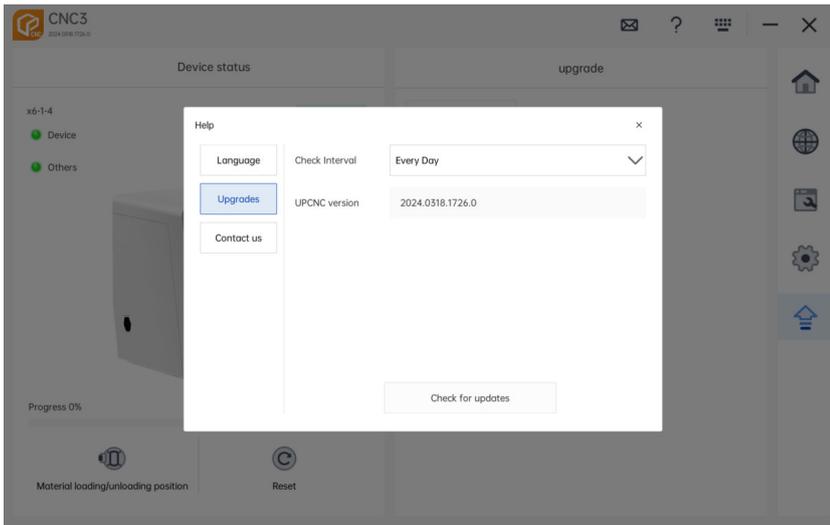
Restart Device Upgrade: As shown in Figure 4.1, after entering the firmware upgrade page, select the corresponding upgrade package and click "Restart Device Upgrade." This will erase the current firmware of the machine, switch it to BOOT mode, and require reconnection to BOOT mode.

Write Firmware: In BOOT mode, manually select the firmware package that needs to be upgraded, click "Write Firmware," and wait for the firmware to be successfully written. After a few seconds, you can reconnect the machine.

7.7 CNC3 Help Interface

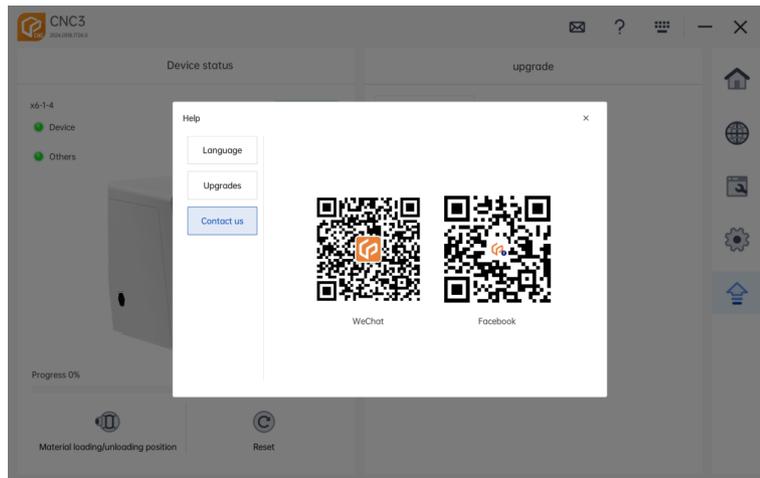


Language Interface: Click on the dropdown menu, select the desired language to switch to, then click "Confirm" to change the language.



Check for Updates Interval: Click the dropdown menu to display the update checking interval options: daily, weekly, or monthly.

Check for Updates: Click "Check for Updates." If there are no new versions available, it will prompt that the current version is up to date. If there is a new version available, it will automatically initiate the upgrade process.

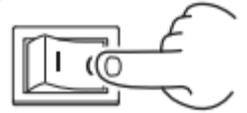


Contact Customer Service: You can scan the corresponding QR code to contact customer service.

08/Machine Startup

8.1 Machine Startup

- Ensure that the equipment operating door is closed.
- Turn on the main power switch of the equipment.
- Press the power button on the front panel of the equipment.
- Start CNC 3 at the control end.
- The intelligent light bar and internal indicator lights of the equipment illuminate.
- The equipment starts successfully.

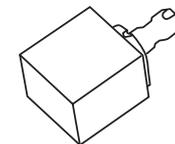


8.2 Pre-processing Preparation

Improper use can result in damage to tools and materials or affect cutting effectiveness. Please ensure the correct material type and size specifications for cutting, and use original factory milling cutters for milling. Also, to avoid material movement and vibration during cutting, ensure that the material tray is properly locked.

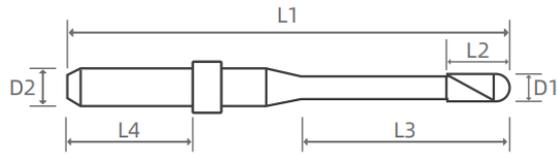
8.2.1 Supported Cutting Materials

Zirconia, PMMA, PEEK, wax, composite resin, and soft cobalt-chromium alloy.
 Disc (with step): Diameter 98.5mm, Height 10-30mm
 Square: Pin diameter 6mm



Note: When cutting square materials, an additional square clamp is required.

8.2.2 Supported Tool Information



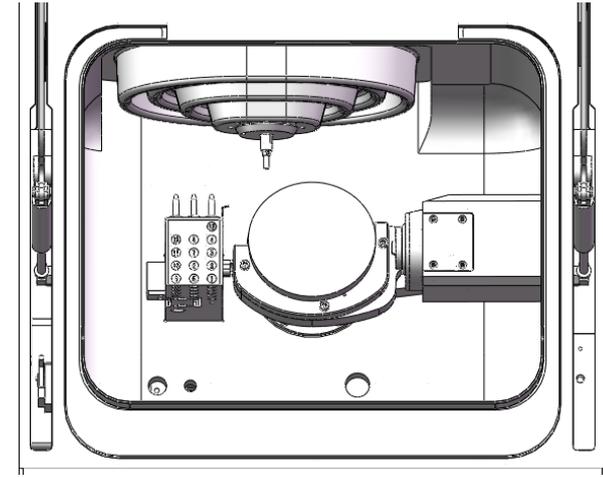
Length L1: 50mm Shank diameter D2: 4mm
Tool specifications are for reference only.

8.3 Material Installation

Important: To avoid accidental injuries while working, please wear gloves when operating in the machining room.

8.3.1 Installing Disc Materials

1. Open the equipment operating door and simultaneously click on the material loading and unloading position in CNC 3.
2. Use an Allen wrench to loosen the 3 bolts on the fixture used for fixation, but do not remove them.
3. If there is a mounted tray, remove it and use a brush to clean the fixture, ensuring no residue remains.
4. Install the disc material from top to bottom into the fixture. If the material is multi-layered, ensure the top color side is facing you.
5. If you are using a processed tray, rotate it to the marked position on the fixture to avoid cutting abnormalities.
6. After installation, use a wrench to tighten the fixing bolts to ensure the material is secure and ready for machining.

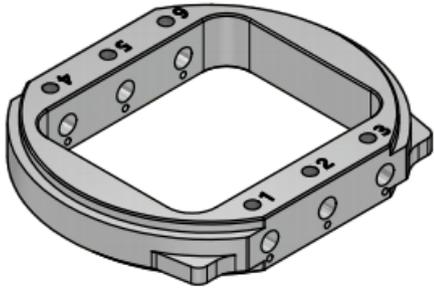


Note: Residues and improper fixation in the tray can lead to damage to the current cutting material. Please confirm cleanliness and installation before machining.

8.3.2 Installing Square Materials

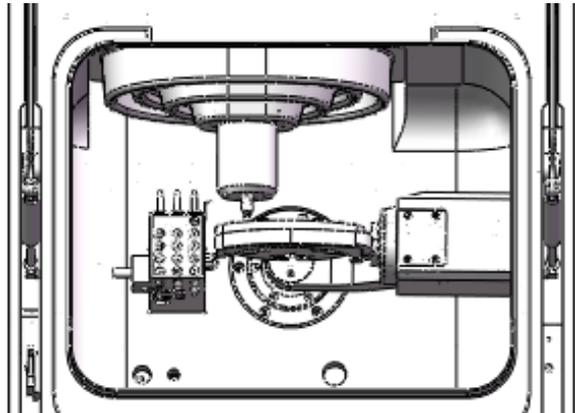
Install the square material onto the BK-1 fixture. The BK-1 fixture supports the installation of up to 6 square materials simultaneously.

1. According to the corresponding machining positions in UPCAM layout, install the square material, and please confirm the installation positions are correct.
2. Take out the BK-1 chuck body and loosen the bolts at the intended machining positions using a wrench, but do not remove the bolts.
3. If the square material is multi-layered, ensure that the top area of the material is positioned at the top during installation.
4. After confirming the correct installation position of the material, align the groove on the tail of the material with the locating pin on the chuck body and insert it to secure.
5. After ensuring the material is tightly secured and cannot rotate, use the wrench to tighten the corresponding square material bolts to secure it in place, completing the installation.



Installing square material in the workspace:

1. Open the equipment access door and click on the material loading position in CNC 3.
2. Loosen the three bolts used to secure the chuck body with an Allen wrench, but do not remove them.
3. If there is a material tray installed, remove it and use a brush to clean the chuck, ensuring there are no residues.
4. Install the BK-1 chuck body with the square material from top to bottom into the workspace chuck.
5. After installation, use a wrench to tighten the bolts to secure the material, ensuring it is firmly fixed and ready for machining.

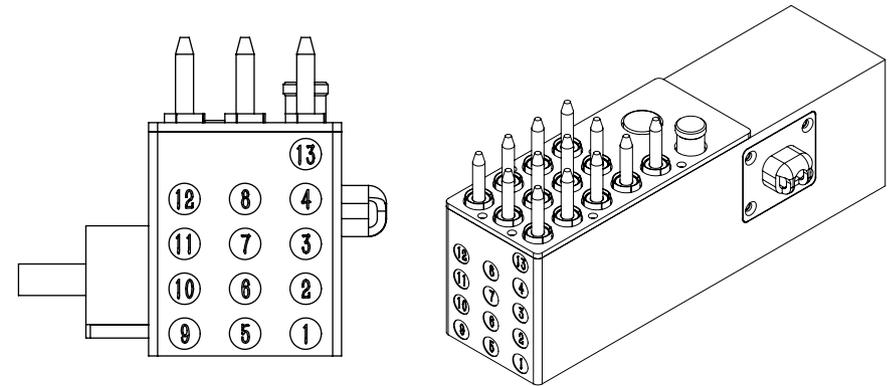


8.4 Tool Installation

Before starting formal machining, it's essential to install the correct milling cutter at the corresponding position in the tool magazine. Using the wrong milling cutter may damage the spindle or the material being processed. To ensure the machining effect, it's recommended to use original milling cutters.

8.4.1 Tool Installation Position

When the device runs toolpath files to cut different materials, different milling cutters are required to execute the cutting instructions. You need to install the milling cutter according to the designated position.



8.4.2 Automatic or Manual Tool Change

Tool replacement can be operated through the CNC interface. This is applicable when the tool reaches its maximum lifespan but remains clamped to the spindle. In such cases, an automatic or manual tool change is needed to remove the milling cutter.

Tool Lifespan: The CNC system will record information about the tool's lifespan. When the tool reaches its maximum usage limit, it should be replaced promptly. After replacing the tool, remember to reset the recorded information in the CNC system. Refer to the CNC guide for specific instructions.

Automatic Tool Change: By clicking the "Return Tool" button in the CNC interface, the device will return the tool currently held by the spindle to its corresponding position in the tool magazine. Refer to the CNC guide for details.

Manual Tool Change: By clicking the "Release Tool" button in the CNC interface, the currently clamped tool in the spindle will automatically drop. Make sure to wear gloves to catch the falling tool in advance. Refer to the CNC guide for details.

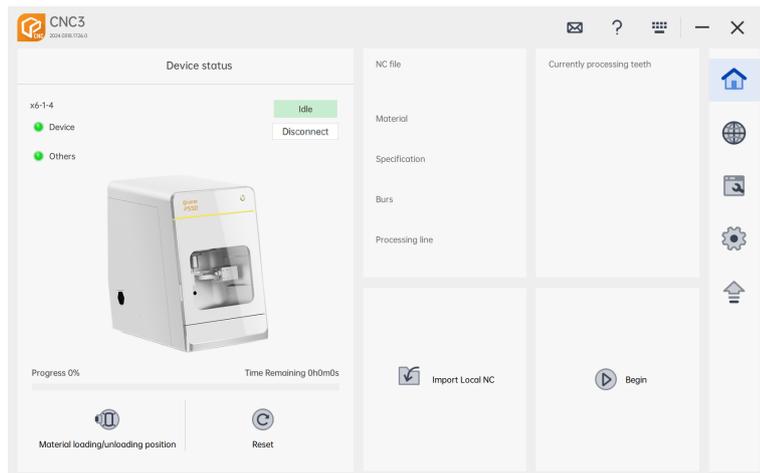
8.4.3 Starting, Pausing, and Canceling Machining

Before cutting, please ensure the following:

- Use UPCAM to layout the repair file and generate the NC file (toolpath file).
- The material is installed in the fixture and securely clamped.
- The appropriate tool for cutting the current material is installed in the tool magazine, and the tool lifespan is normal.
- Ensure the CNC 3 is connected to the device stably.

8.4.4 Starting Machining

1. After verifying everything is correct, close the door of the machining room.
2. Ensure the dust extraction device is properly connected and activate the dust extraction function.
3. In the CNC 3 interface, click the "Import File" button to select and successfully import the desired NC file for cutting.



4. Click the  "Start" button in the CNC 3 interface to initiate the cutting process on the device.

8.4.2 Pausing and Resuming Cutting

Pause Cutting: During the cutting process, click the "Pause" button. This action will interrupt the cutting process.

Resume Cutting: After the cutting process is interrupted, if you need to resume cutting, click the "Start" button again, and the device will resume cutting.

8.4.3 Canceling Cutting

1. During the cutting process, click the "Pause" button to interrupt the cutting.
2. After the cutting process is interrupted, click the "Reset" button. This action will return the device to the standby state, clearing all states and instructions.
3. Then click the "Home" button to move all axes of the device to the origin position.

8.5 Shutting Down the Device

- Ensure cleanliness in the machining room.
- Close the machining room door.
- Turn off the start button on the front panel of the device.
- Turn off the main power switch of the machine.

09/Maintenance of Equipment

9.1 Daily Maintenance

Please pay attention to the daily maintenance of your equipment, as it can ensure that your device executes machining commands effectively and delivers satisfactory results. Therefore, your daily maintenance of the equipment is crucial.

Please adhere to the maintenance requirements outlined for your equipment and perform the necessary maintenance tasks. The following maintenance procedures require simple manual operations. If you are unsure about any maintenance procedures, feel free to contact technical support for guidance.

Cleaning spots	Tools used	Key points for cleaning	Cleaning cycle
Work compartment	Clean, dust-free cloth. Double-headed cleaning brush.	1. Clean the interior of the machining chamber using a cleaning brush, and finally wipe it with a lint-free cloth. 2. Clean the tool sensor, fixture, observation window, and tool magazine.	Daily cleaning
Spindle Collet	Double-headed cleaning brush Cleaning brush Fluted nut Cleaning cone	1. Go to the equipment maintenance interface, then calibration, and select spindle cleaning. 2. Move the spindle to the center position of the machining compartment and use a double-headed brush to clean the spindle area. 3. Click on "Release Tool", then remove the collet nut, place it in the calibration rod, and insert it into the spindle.	Monthly cleaning

Cleaning spots	Tools used	Key points for cleaning	Cleaning cycle
Spindle Collet		4. After securing the spindle collet, rotate it counterclockwise to remove the spindle collet. 5. Use a cleaning cone to align the spindle bore and insert it for rotational cleaning. 6. Use a cleaning brush to quickly rotate and clean the spindle collet. 7. Clean any remaining areas with a clean cloth. 8. Reinstall the spindle collet using the disassembly method and rotate it clockwise to ensure it is securely locked. 9. Click on "Clamp Tool". After that, the equipment can be returned to zero and used normally.	Monthly cleaning
Exterior	1. Clean, lint-free cloth 2. Alcohol	1. Before cleaning the equipment, ensure the power is turned off. 2. Dampen a clean, lint-free cloth with alcohol. 3. Gently wipe the outer casing of the equipment. 4. Allow the casing to air dry after wiping. 5. Resume normal operation.	Clean according to your actual needs
Device Calibration	Calibration disk Calibration rod Clean, lint-free cloth	Refer to the previous section for detailed calibration steps.	Perform every quarter
Update Software Firmware	Contact technical support for remote updates	Regular iterations are conducted to optimize and provide you with the best experience.	We will contact you promptly before updating

9.2 Maintenance Work

For all maintenance-related issues, please contact the UP3D technical support department for assistance. They will provide you with spare parts, maintenance tips, and perform preventive maintenance upon your request. When delivering or installing the machine, please inquire with the service personnel for detailed contact information of the customer service team.

9.3 Warranty Service

The equipment comes with a warranty period of 12 months or 2,000 operating hours, whichever comes first. During this period, we provide free after-sales service. However, it's important to note that even within the warranty period, UP3D will charge for repair services under the following circumstances, including repair fees and parts costs:

- Damage caused by human factors.
- Improper use of the equipment.
- Natural disasters beyond control.
- Replacement or use of components or tooling not approved by UP3D.
- Disassembly and repair by unauthorized professionals.
- Other malfunctions not caused by the equipment itself.
- After the warranty period, UP3D will provide paid repair services.

These terms are intended to ensure free after-sales service under normal usage and maintenance conditions but do not cover issues caused by improper user operation, external factors, or unauthorized repairs. If you require repair services during or after the warranty period, please feel free to contact UP3D for detailed information and support.

10/Troubleshooting

If your equipment fails to operate correctly or experiences abnormalities, please refer to the following troubleshooting guide. Please note that improper troubleshooting may damage the equipment. If you are unable to resolve the issue or confirm the problem, please contact technical support for assistance.

10.1 Tool Change Issue

When this fault occurs, a prompt box will appear on the software interface, indicating that the tool change has failed during the process.

Reasons:

- During processing: If this prompt appears during processing, it may be due to tool damage or failure to clamp the tool during tool change, which interrupts the process. After troubleshooting, reprocessing is required.
- Not in processing: This status mainly occurs during tool clamping or tool return, indicating tool inspection failure, including tool damage or no tool placed in the tool library.

Solution:

- Click the "Loosen Tool/Clamp Tool" button to check if the spindle chuck opens, and perform maintenance to ensure its cleanliness.

10.2 Limitation Issue

When this fault occurs, a prompt box will appear on the software interface, indicating that the equipment has touched the limit during operation or exceeded its travel range.

Reasons:

- Mechanical limit: If the X-axis, Y-axis, or Z-axis hard limits appear, it is a machine limit issue caused by the movement axis hitting the limit switch.
- Motion limit: When this prompt appears, it may indicate that the next motion step of the processing program exceeds the specified range, causing a motion limit.

Solution:

- For mechanical limits: Close the prompt box by clicking "OK" and then click the "Reset" button on the software interface, or restart the lower machine.
- For motion limits: Close the prompt box by clicking "OK" and then click the "Stop" button, revise the NC file or regenerate it before proceeding.

10.3 Unsatisfactory Machining Results/Broken Tool

- Check the tool's lifespan: Ensure the coating condition of the tool. Replace worn-out tools promptly.
- Check material installation: Improper material placement affects machining results.
- Check software and equipment matching: Ensure consistency between software settings and machining requirements.
- Check machining file quality: Verify the repair body and layout data for accuracy.
- Check spindle chuck cleanliness: Clean and maintain the spindle chuck.

11 / Equipment Disposal

11.1 Processing Residues

When handling processing residues, comply with relevant regulations:

1. Avoid hazardous residues entering soil, water, or drains.
2. Adhere to national and local laws at disposal sites.
3. If necessary, dispose of residues through approved processing companies.

Retain reference samples of disposed products for at least six months.

11.2 Disposing of Machines

Before disposing of equipment, contact technical support. If you dispose of the machine independently, comply with national and local laws. If necessary, use approved processing companies for disposal.

12/Product Technical Specifications

The basic parameters of the UP3D Intelligent Five-Axis Dental Milling Machine P55D are as follows:

P55D Technical Specifications	
Application:	Dry Processing
Processable Materials:	Zirconia, Wax, PMMA, PEEK, Composite Resins, Cobalt Chromium Alloys
Material Specifications:	Disc: Thickness 10-30mm / Diameter 98.5mm, Block: 40*20*20mm (Max)
Indications:	Inlays, Anatomy Crowns, Open Cusps, Inlays, High Inlays, Veneers, Sleeve Crowns, Bases, Grinding Tooth Pads, Full Dentures, etc.
Structure:	Machine base made of solid aluminum casting
Number of Axes:	5 Axes
Linear Axes X/Y/Z Axis:	Precision ball screw drive, Precision guide rail with repeatability accuracy of $\pm 0.003\text{mm}$
Rotational Axes A/B Axis:	A-axis: 360° , B-axis: $\pm 33^\circ$
Control System:	High-resolution full servo drive system
Lighting Device:	LED lighting inside the working chamber, additional status display
Equipment Power:	1.0KW (max)
Type:	High-frequency electrical spindle, automatic tool change, no need for air supply
Speed:	60,000 rpm (max)
Tool Shank Clamping Diameter:	$\Phi 4$

Power:	0.8KW (max)
Tool Change:	Tool magazine accommodates 13 tools, tool length can be measured and tool breakage checked with precision tool setter
Voltage:	100VAC~130VAC、200VAC~240VAC (selectable) 50 ~ 60Hz
Dust Extraction:	Filtration Level: M, Suction Flow Rate: 2500L/min
Data:	Wi-Fi, USB, Ethernet ports
Operating Temperature Range:	10 °C ~ 35 °C
Operating Air Humidity:	Below 80% (relative), non-condensing
Dimensions:	Length*Width*Height=560×442×704 (mm)
Weight:	106KG
CAM Software:	UPCAM、Millbox

13/Storage and Transportation

13.1 Storage

- Avoid direct sunlight.
- Do not expose to rain.
- Equipment should be used in the following environmental conditions:
 - ① Temperature: 10°C to 35°C
 - ② Humidity: Below 80% (relative humidity), without condensation

13.2 Transportation

- Transport the machine flat, preferably in its original packaging.
- Avoid severe vibrations.
- If the equipment is transported in cold or humid conditions, upon arrival at the customer's location, it should be placed indoors to reach thermal equilibrium with room temperature before use.
- Otherwise, there may be risks of overcooling or excessive humidity, leading to short circuits.

Dear valued customer,

Upon receiving the product, please take the time to carefully review the contents of this document. If you have any questions, concerns, or need further support, please contact us immediately. We will promptly assist you. Once you agree with the above content, please sign below to confirm receipt and return this receipt to us. Additionally, we warmly welcome any feedback or comments you may have.

The purpose of this receipt is to ensure mutual understanding between us and to provide a record to ensure that the delivered product/service meets your expectations.

Thank you for choosing UP3D. We look forward to continuing to provide you with excellent products/services.

Warm regards,

[Customer Signature]

Date: _____

If you require technical support, please scan the QR code below, and we will provide you with professional guidance and technical assistance.



Information Retrieval



Technical Support